TROPICAL MEAN EARTH RADIANCES AS A VALIDATION TOOL

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DEFINITION

The Tropical Mean (TM) statistic is the average value of nadir longwave Earth radiance over Tropical Ocean ($\pm$ 20^0), all sky conditions. This parameter is relatively stable with low temporal variability

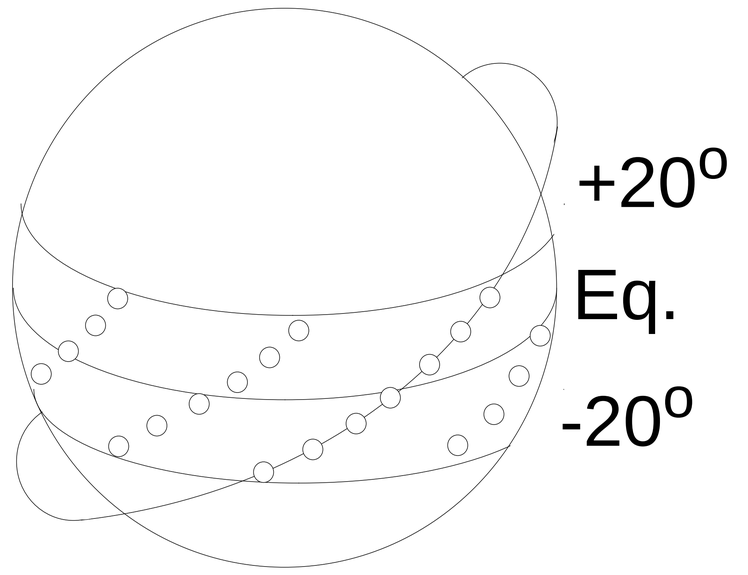
The averaged daily TM radiance value should have a mean latitude of $90.1^0 \pm 2^0$ and a mean longitude of 185 ± 20^0 verifying uniform sampling.

Tropical Ocean minimizes diurnal effects in the measurements. Residual diurnal effects are model removed, correcting the measurements to a noon orbit.

The ERBE-ERBS Scanner night time tropical mean over the 5-year mission is used to baseline the TM statistic.

Monthly Mean Nadir Radiance at Night for ERBS

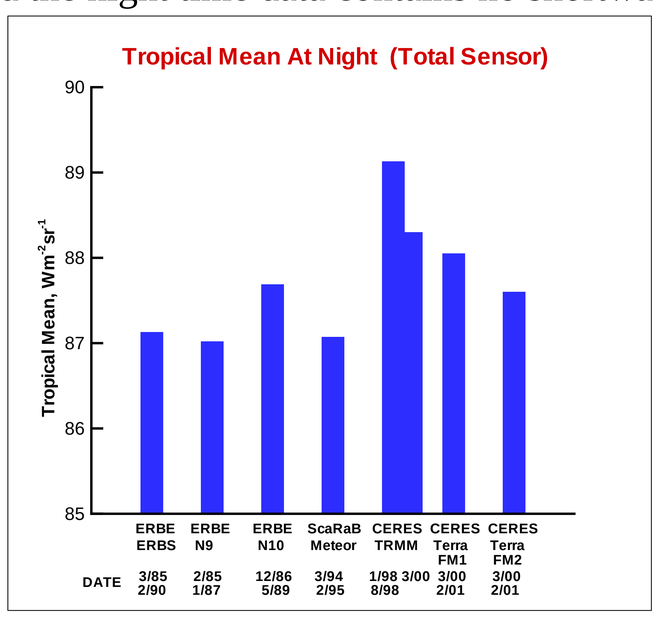
	1985	1986	1987	1988	1989	Mean	Std
Mar	87.61	86.63	88.60	88.51	88.42	87.95	0.84
Apr	87.14	87.20	87.38	88.02	86.79	87.31	0.45
May	87.52	87.29	87.44	87.27	87.16	87.34	0.14
Jun	87.83	86.13	87.46	87.64	87.10	87.23	0.67
Jul	87.10	87.18	87.50	86.79	87.35	87.18	0.27
Aug	86.43	86.16	87.11	86.92	87.17	86.76	0.44
Sep	86.60	86.68	87.38	87.37	87.45	87.10	0.42
Oct	87.58	87.88	87.55	86.90	87.09	87.40	0.40
Now	87.20	86.20	87.00	86.54	86.49	86.69	0.41
Dec	87.06	85.74	87.38	86.36	87.08	86.72	0.67
Jan	86.77	86.73	86.84	86.81	86.00	86.65	0.36
Feb	87.56	87.21	87.86	86.29	87.17	87.22	0.59
Mean	87.20	86.76	87.45	87.12	87.11	**87.13**	
Std	0.44	0.62	0.45	0.67	0.57		**0.58**

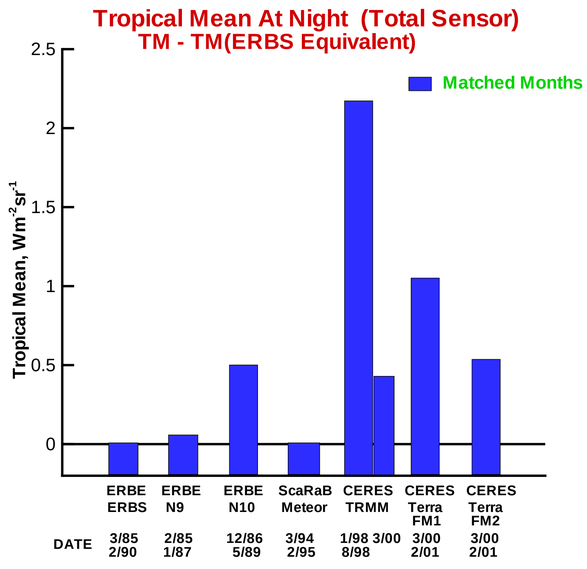


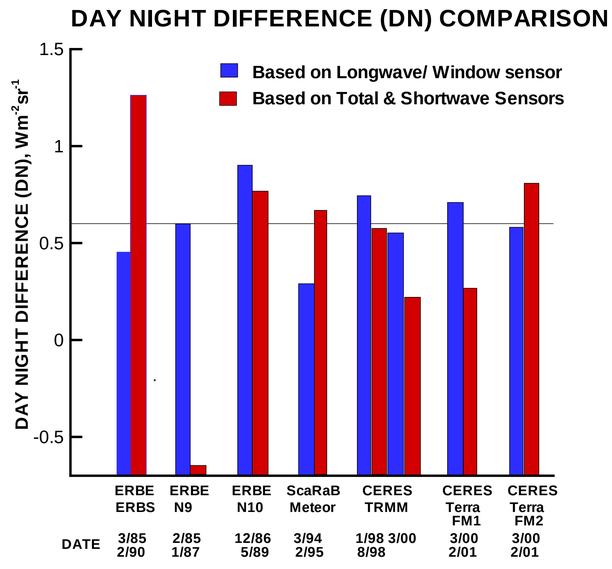
APPLICATIONS

1. Intercomparison of radiometers using the TM at night as a statisiticT

   Nighttime longwave TM from thebroadband total channel is used for the intercomparison of radiometers since the response from the total sensor is flat and the night time data contains no shortwave component. The 5 year averaged TM value for ERBS is taken as the standard baseline





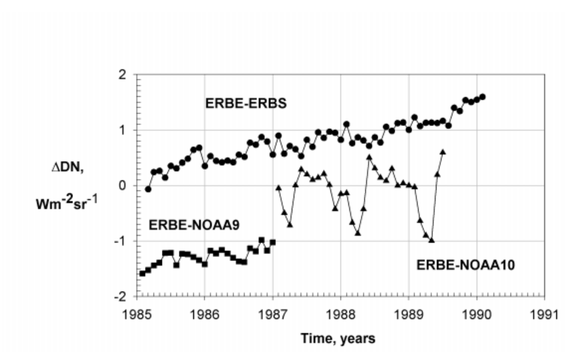


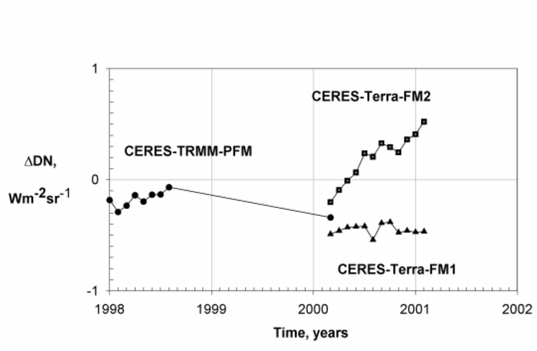
2. Comparison of the day-night difference (DN) in Tropical Mean from various radiometers' longwave sensors.

   The average day-night difference (DN) in TM from the longwave sensors from 7 radiometers is $0.6 \pm 0.09 Wm^{-2}sr^{-1}$, which is a reliable hitorical record. Each of the DN calculated from the longwave sensors, and from total and shortwave sensors is compared to the average DN difference.

3. Comparison of day night difference (DN) derived by two methods on the same instrument (ΔDN).

   The longwave TM in each instrument can be determined either from the longwave (window) sensor or bydifferencing the shortwave sensor measure-ment from that of the total sensor. The difference between DN based on total and shortwave sensors and DN based on longwave (window) sensor will test the consistency between the 3 sensors.





REFERENCE

"The Tropical Mean as a Validation Parameter for Satellite Radiances", R. N. Green, K. J. Priestley, *Journal of Atmos. and Oceanic Technology*, Submitted May '01